YASHICA FRI, FRII

Similar models: Yashica FR, Contax RTS (mechanically similar)

Battery: 1 ea. 6V PX28 or 544

Note: The FRI and the FRII use the same circuit and shutter module. The FRI has a full range of manual speeds; the FRII limits the wiper movement for just auto, bulb, and the flash speed.

Fig. 1 — top cover removed
Fig. 2 — bottom cover and tripod-socket plate removed
Fig. 3 — mirror-box/shutter module, back
Fig. 4 — mirror-box/shutter module, wind side
Fig. 5 — mirror-box/shutter module, bottom
Fig. 6 — flex circuit pictorial
Fig. 7 — lower terminal board
Fig. 8 — IC pin numbering
Fig. 9 — timing, charge cam

ADJUSTMENTS:

512mv	A
Offset	B
Constant voltage	C
Manual 1/30	D
Meter, high light	E
Auto shutter speeds	F
Meter, low light	G
Brake, first curtain	H
X sync	I
Release magnet	J
Travel time, first curtain	K
Travel time, second curtain	L
1/1000	M
First-curtain position	N

Note: Reach the trigger-switch adjustment for 1/1000 second from inside the mirror box after removing the lens. You do not have to disassemble the camera to adjust the fast speeds.

Normally do not disturb: A, B, C, D. The new version of the flex circuit replaces these four variable resistors with fixed resistors.

ADJUSTMENT VALUES:

Curtain-travel time: 12ms +0.2, -0.5ms (32mm distance)

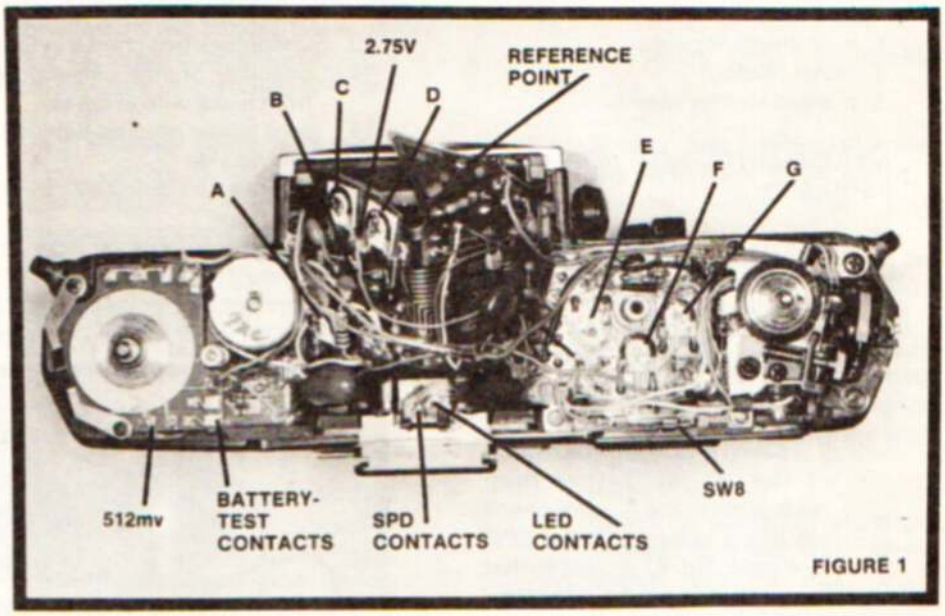


FIGURE 1

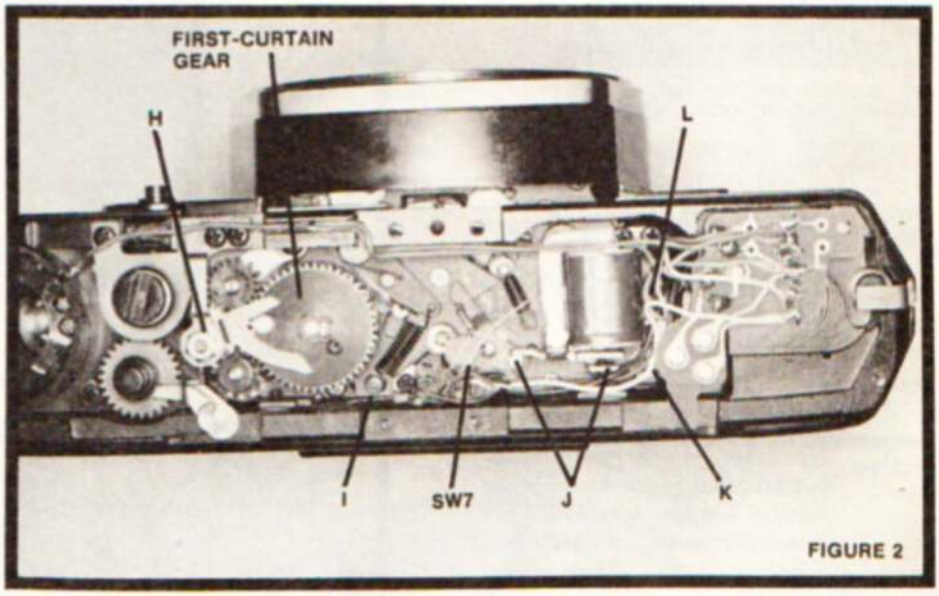


FIGURE 2

Flange-focal distance: 45.65mm (flange to pressure-plate rails)
Flash speed (FRII): 1/42 second

Conditions for voltage tests: Make measurements to the reference point shown in Fig. 1 (negative) with the exposure-preview switch SW8 closed. Use the settings of ASA 100 and auto with the lens removed. Yashica suggests simulating a new battery by using a 6.4V power supply in series with a 40-ohm resistor to power the circuit.

Curtain positions: There should be a space gap of 0.1 to 0.3mm between the two curtain bars with the shutter cocked, Fig. 3. Adjust by moving the screw on the first-curtain winding roller to a different hole.

Release magnet: Adjust for a 0.6mm space gap between the core and the armature of the release magnet. A pressure of 20 grams on the armature should release the mirror. Also, the release magnet should attract its armature and release the mirror with 2.1V applied across the coil (between the two black wires to the release magnet, Fig. 6).

X sync: Adjust by reforming the sync contacts or by retiming the first-curtain gear, Fig. 2.

ADJUSTMENT SEQUENCE FOR EXPOSURE:

1. auto shutter speeds
2. meter readout
3. manual shutter speeds

ADJUSTMENTS NOT NORMALLY REQUIRED:

1. Constant voltage. Adjust for 2.75V to the pink wire, Fig. 1 (pin 38 of the IC).
2. 512mv. Adjust for 512mv to the green wire at the film-speed board, Fig. 1 (pin 3 of the IC).
3. Offset. Check the voltage at pin 9 (273mv) and at pin 10 (280mv) of the IC (or, rather than measuring to the IC pins, check the offset voltages at the SPD terminals, Fig. 6). Adjust so that the voltage at pin 10 is 3 to 7mv higher than the voltage at pin 9.

DISASSEMBLY HIGHLIGHTS:

Control positions: unimportant

Precautions:

1. Remove the battery before unsoldering wires.
2. Note the wire color codes before unsoldering. The color codes may vary.

Sequence:

1. top cover — unscrew release-button collar as one assembly to remove wind lever (release pin loose), remove cemented plate in center of speed knob, speed knob, film-speed dial
2. bottom cover
3. tripod-socket plate (to reach SW7, Fig. 2)
4. self-timer lever
5. 2 sections, front leatherette
6. 4 front-plate screws
7. lift aside front plate to reach mirror-box switches
   Note: To remove the front plate completely, unsolder the diaphragm-resistor wires — green and purple from the film-speed board, yellow from the flex circuit.
8. gray galvanometer wire from film-speed board
9. eyelens
10. detent spring above film-speed resistor
11. retaining ring holding film-speed brush
12. lift aside film-speed resistor to reach flex-circuit wires
13. unsolder wires shown in Fig. 6
14. unsolder orange galvanometer from black wire at splice
15. post screw holding flex circuit, rewind side
16. 3 screws holding flex circuit at wind side
    Note: If you're replacing the flex circuit, also desolder the connections for the SPD and the LED, Fig. 6; a new flex comes without these components. If you're just removing the mirror-box/shutter assembly, you can remove the SPD holder (2 screws) to take off the flex circuit. Alternately, you can remove the flex circuit with the mirror-box/shutter assembly.
17. shutter-speed brush
18. support plate for shutter-speed brush (3 screws, wind side)
19. unsolder white SW7 wire and purple SW1 wire from lower terminal board, Fig. 7
20. first-curtain brake assembly
21. SW8 assembly (1 screw with wire clamp, also disconnect coupling wire that goes to wind-

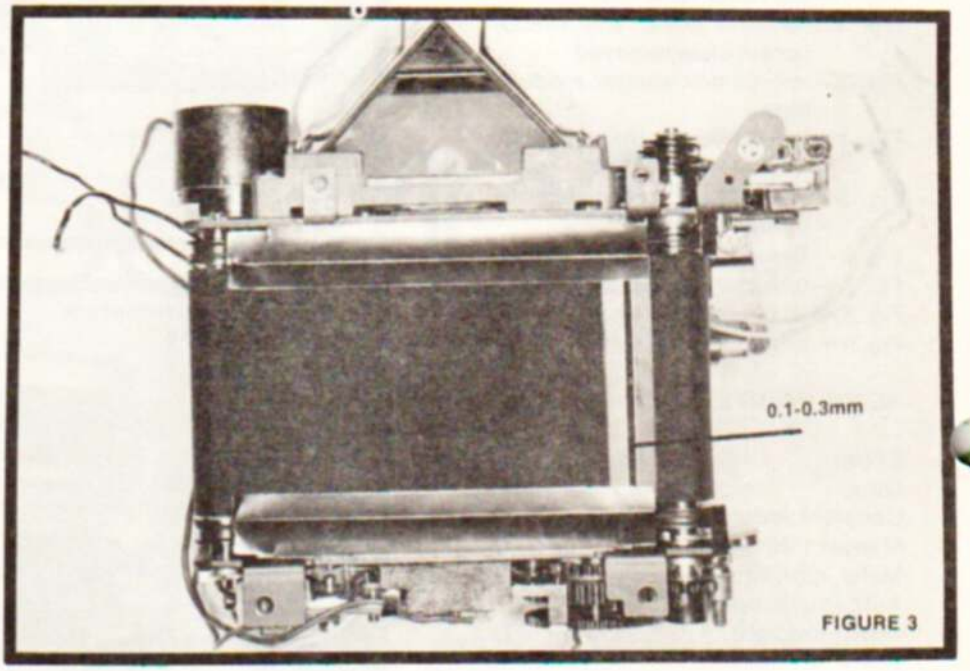


FIGURE 3

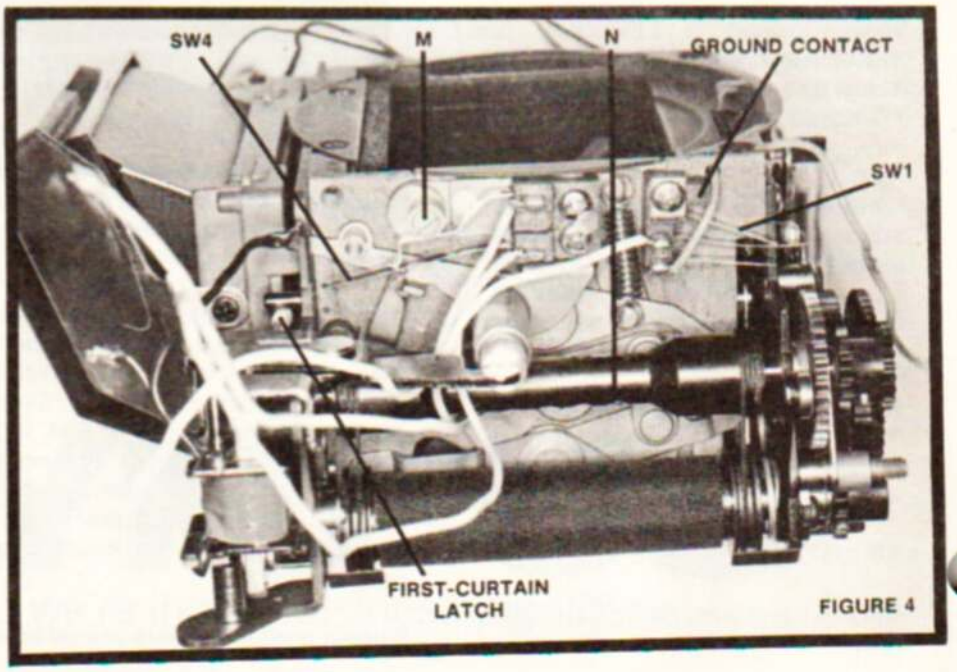


FIGURE 4

lever collar)

22. wire clamp, front of camera, rewind side
23. self-timer mechanism (2 screws)
24. 4 screws, back of focal-plane aperture (2 of the screws are under the porous-plastic light-trap material)
25. lift out mirror-box/shutter assembly from the top of the camera

REASSEMBLY HIGHLIGHTS:

1. Before replacing the mirror-box /shutter assembly, turn the power-winder coupler at the bottom of the camera to position the charge cam as shown in Fig. 9; the straight side of the charge cam then aligns with the edge of the body casting. Also charge both the shutter and the mirror box.
   Note: To cock the shutter and the mirror box, rotate the shutter-charge gear, Fig. 5, in a clockwise direction (as seen from the bottom) until the curtains latch half way across the focal-plane aperture. Then push the mirror-charge lever to charge the mirror. Finally, turn the shutter-charge gear to complete the wind cycle. Release the mirror by pushing the armature of the mirror-release magnet against the core.
2. Cock the shutter before replacing the tripod socket; the X-contact closing lever remains on the tripod-socket plate.
3. If you remove the first-curtain gear, Fig. 2, replace the gear with the shutter charged; the post on the gear should point to the front of the camera. You can then vary the gear timing if necessary to adjust the X sync.

TROUBLESHOOTING:

Behavior without battery: shutter will not release, no meter

Positions and functions of switches:

SW1. Timing switch for power winder, wind side of mirror box. With the shutter released, SW1 connects the purple wire to the white wire (power-winder terminals 2 and 3). The white-wire contact engages the ground contact with the shutter cocked, connecting the release magnet to ground.

SW2. Battery-test switch in top cover. To check the battery test, short together the two battery-test lands on the film-speed board, Fig. 1; the battery-test lamp should turn on.

SW3. Release switch at bottom of wind mechanism. Pushing the release button connects the gray release-switch wire to the black wire (ground).

SW4. Trigger switch, wind side of mirror box. Should be open with the shutter released, closed with the shutter cocked. Opening the trigger switch starts the timing cycle.

SW5. X-sync contacts at bottom of camera.

SW6. Auto-manual-bulb selector, under the circuit board at the wind side of the flex.

SW7. Bottom of camera. With the mirror down, the blue-wire contact moves against the white-wire contact, connecting the release magnet to ground. The other contact has no function in the FR-I and FR-II (it provides the power-switch connection in other models, such as the RTS).

SW8. Exposure-preview switch, top of camera, wind side. SW8 turns on the meter readout, but it has no effect on the shutter operation.

SW9. Self-timer switch, back of self-timer mechanism. Closes to release the shutter at the end of the self-timer delay.

Troubleshooting steps for specific symptoms:

1. Shutter does not release under any conditions, meter works
   Release switch SW3, poor contact
   Check by shorting between the gray wire and the black wire (ground), wind side of flex circuit, Fig. 6. If the shutter then releases, check the release switch and wiring. To clean the release switch, remove the wind mechanism.
   Release magnet
   Check the continuity of the coil between the two black wires, rewind side of flex circuit (under the film-speed board), Fig. 6. Approximate resistance of coil — 21.5 ohms. The release magnet should attract its armature and release the mirror if you apply 2.1V between the two black wires.
   SW1, poor contact
   Check the continuity between ground (camera body) and the white wire of SW1, Fig. 6. You should measure direct continuity with the shutter cocked. No continuity — clean and/or reform the ground contact of SW1, Fig. 4.

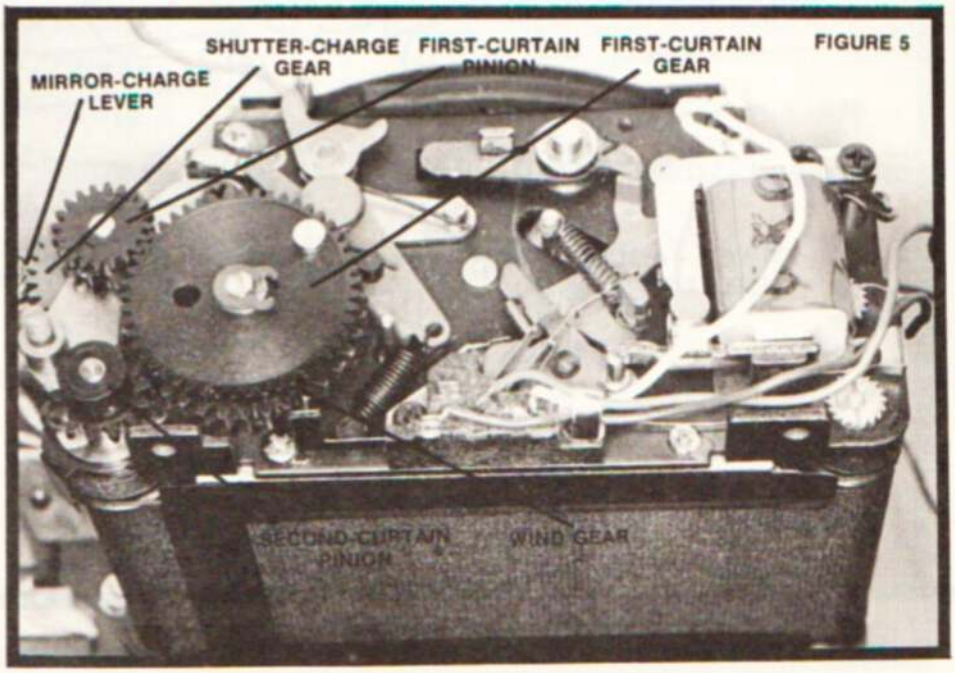
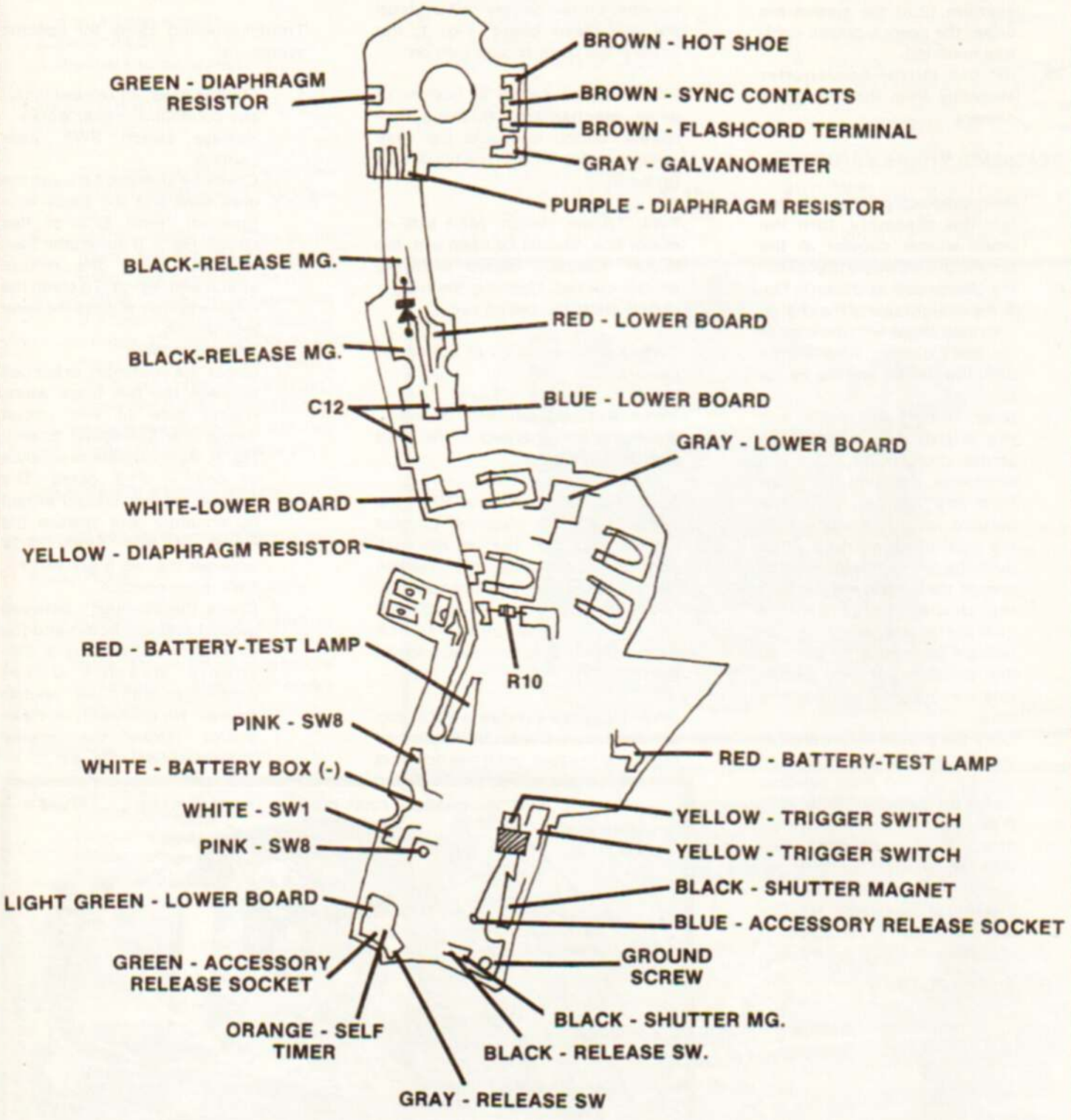


FIGURE 5

FIGURE 6


BROWN - HOT SHOE
GREEN - DIAPHRAGM RESISTOR
BROWN - SYNC CONTACTS
BROWN - FLASHCORD TERMINAL
GRAY - GALVANOMETER
PURPLE - DIAPHRAGM RESISTOR
BLACK-RELEASE MG.
RED - LOWER BOARD
BLACK-RELEASE MG.
C12
BLUE - LOWER BOARD
GRAY - LOWER BOARD
WHITE-LOWER BOARD
YELLOW - DIAPHRAGM RESISTOR
RED - BATTERY-TEST LAMP
R10
PINK - SW8
RED - BATTERY-TEST LAMP
WHITE - BATTERY BOX (-)
WHITE - SW1
YELLOW - TRIGGER SWITCH
PINK - SW8
YELLOW - TRIGGER SWITCH
BLACK - SHUTTER MAGNET
LIGHT GREEN - LOWER BOARD
BLUE - ACCESSORY RELEASE SOCKET
GREEN - ACCESSORY RELEASE SOCKET
GROUND SCREW
BLACK - SHUTTER MG.
ORANGE - SELF TIMER
BLACK - RELEASE SW.
GRAY - RELEASE SW

SW7, poor contact
Check the continuity between the blue wire and the white wire at the bottom of the camera, Fig. 7. You should measure direct continuity with the mirror down and no continuity with the mirror up.
Ground screw, Fig. 6, loose

2. Shutter does not release under low light conditions, meter works
LED defective
The LED illuminates the SPD to start the memory time lag. Check the LED with an ohmmeter between the flex-circuit contacts, Fig. 6.
the flex circuit, transfer LED resistor R10, Fig. 6, to the new board. Also transfer capacitor

3. Both curtains run together, all speeds
Shutter magnet, open coil or dirty armature
Check the continuity between the two black magnet wires, wind side of flex, Fig. 6. Approximate resistance of coil — 368K. With 2.5V applied between the two black wires, the shutter magnet should hold the second curtain.

4. Both curtains run together, speeds of 1/60 through 1/1000
Trigger switch SW4, poor contact
Check the continuity between the two yellow wires, wind side of flex, Fig. 6. SW4 should be closed with the shutter cocked, open with the shutter released.

5. No meter readout, shutter o.k.
Galvanometer, open coil or poor solder
Check for a voltage at the gray galvanometer wire, Fig. 6. If you get a voltage to the meter, but no needle movement, check for an open coil. Check the coil continuity between the gray wire and the orange wire (spliced to the black wire at the top of the camera).
Exposure-preview switch SW8, poor contact or solder
Check SW8 by shorting between the two pink wires, wind side, Fig. 6. If SW8 is the problem, the short will turn on the meter.

6. Self timer does not release shutter
Self-timer switch
Check the continuity between the orange wire, wind side of flex, and ground. You should get direct continuity when the self timer runs down. No continuity — clean the self-timer switch at the back of the self-timer mechanism.

7. Needle pegs to bottom shutter hangs open on auto
Green wire at film-speed board, poor solder
Check for 512mv at the green wire. No voltage — check green-wire solder connections and IC, Fig. 6.

8. Needle pegs to top of scale, shutter delivers fastest speed only
Purple wire at film-speed board, poor solder

9. No change in needle position as as you change film speed, but needle position does change for different light levels and diaphragm settings

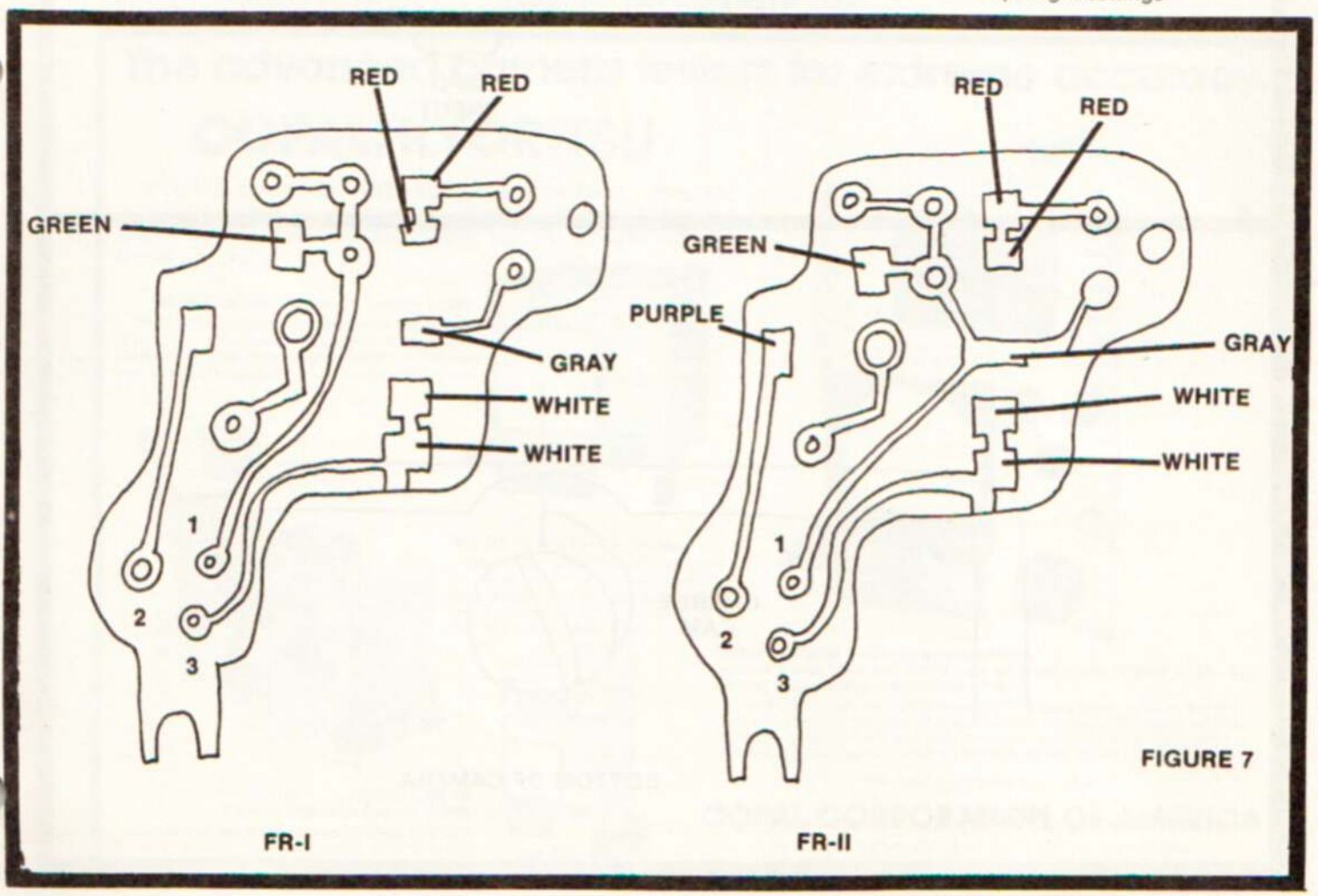


FIGURE 7

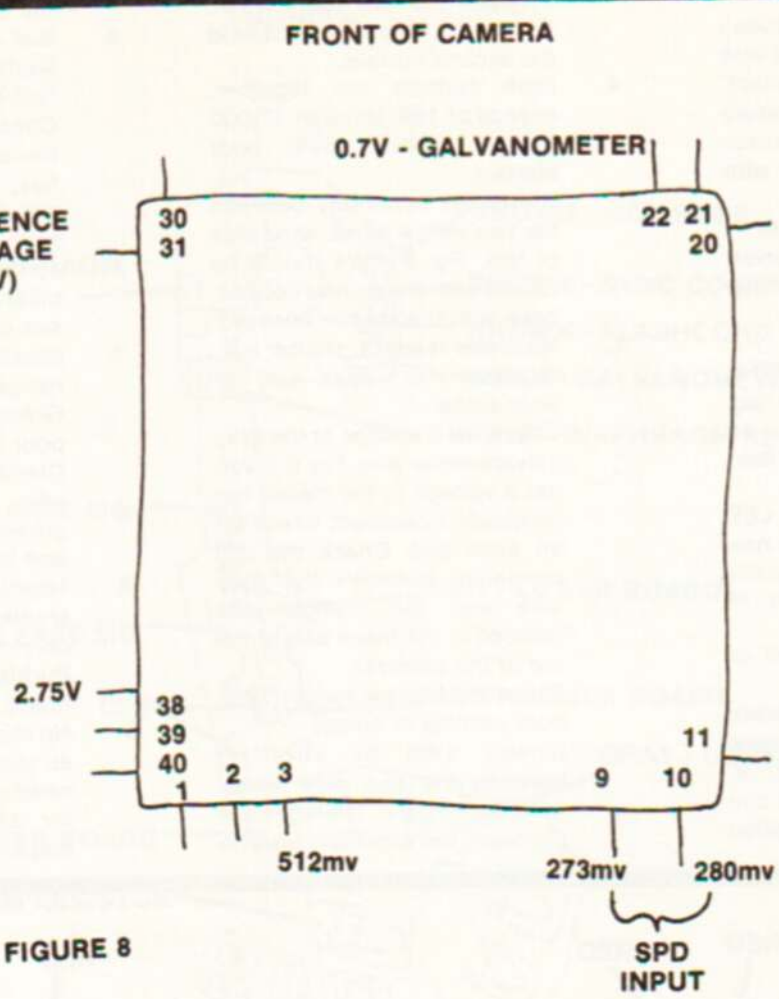


FIGURE 8

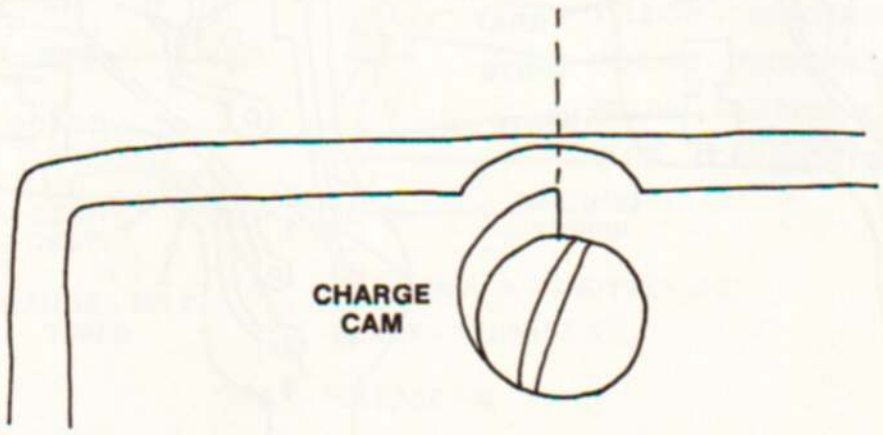


FIGURE 9

Film-speed resistor, poor contact

10. No change in needle position as you change diaphragm setting, but needle moves for light-level and film-speed settings
    Diaphragm resistor, poor contact
    Yellow wire from diaphragm resistor, poor solder
11. Mirror sticks part way up
    Mirror-damping air cylinder, dirty
    Check for smooth operation by lifting and lowering the mirror with your finger. Clean the cylinder and lubricate lightly with shutter oil.
12. Power winder does not advance shutter
    Check the continuity between pins 2 and 3, Fig. 7. You should get direct continuity with the shutter released. No continuity — SW1 is not making good contact (white-wire contact to purple-wire contact).
13. Power winder does not release shutter
    Short power-winder terminal #1, Fig. 7, to ground; the shutter should release. If not, check the solder connections.
14. Mechanical jam
    Check to see if the first curtain is in the charged position and the second curtain is in the released position. If so, disengage the first curtain by pushing the first-curtain latch, Fig. 4. Attempting to charge the shutter without first disengaging the first curtain could damage the gears.

Tips for troubleshooting without disassembly:

If the shutter does not release when you push the release button — but does release at the end of the self-timer delay — the release switch is not making good contact. If the shutter does not release at the end of the self-timer delay — but does release when you push the release button — the self-timer switch is not making good contact.

REVISED PARTS:

Flex circuit. New board does not have the four variable resistors at the rewind side. Interchangeable.

OTHER COMMENTS:

1. You can remove the focusing screen for cleaning without removing the top cover. Remove the two screws at the top front of the mirror box to drop out the focusing screen.
2. The flex circuit comes as a complete unit. If you replace the flex circuit, transfer LED resistor R10, Fig. 6, to th enew board. Also transfer capacitor C12, Fig. 6, to the new board. A replacement flex comes without these components as well as without the LED and SPD.
3. If the shutter jams, excessive force may break the first-curtain pinion (131336) or the second-curtain pinion (131337). Spring pins hold the pinions to the winding-rollers shafts. Each pinion has a single "pick-up" tooth; the pick-up teeth must face the cutout section of the wind gear, Fig. 5.

The advanced camera testers for extreme accuracy.

COPAL/KYORITSU

When it comes to SLRs and other precision cameras, Japanese manufacturers use Copal/Kyoritsu camera testers for quality control. They are designed to test all cameras with extreme accuracy.

MODEL LB-380—Exposure System Tester

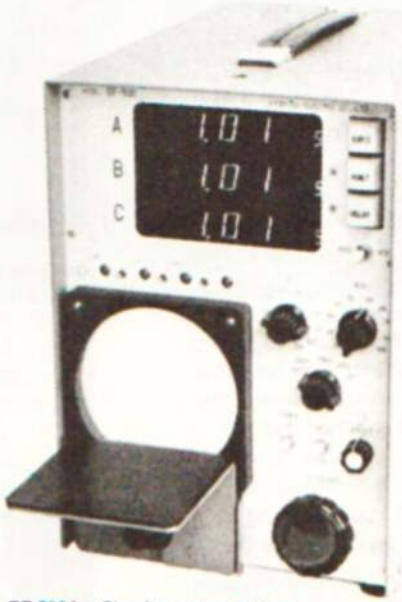
The LB-380 *Lamp Box* is used for the inspection, testing and adjustment of EE cameras, exposure meters and other photographic products. The turrent can be changed to 6 different light values from LV 6 to LV 15.

MODEL FL-400 Shutter Tester

The FL-400 is the finest quality shutter tester with three channel readouts measuring exposure times at three different positions—FP, M and X or synchronizer delay times at once.

MODEL CEE-1A
Camera Exposure System Tester

Consists of an exposure readout box and light recepter cartridges for still cameras and movie cameras.



MODEL EF-500A—Checks exposure time, shutter travel time and delay time of focal plane shutter SLRs, EE 35mm, 110 cartridge and movie cameras.

Has a built-in light source and measures the exposure value at the standard film plane at the time of actual picture taking for EE movie and still cameras at each frame and also measures exposure time, delay time at synchro-contact and the 35mm focal plane shutter's blind traveling velocity.

For catalog and more information

COPAL CORPORATION OF AMERICA

58-25 Queens Blvd., Woodside, N.Y. 11377 Tel: 212/672-9100
L.A. Division: 22010 South Wilmington Ave., Carson, Cal. 90745. Tel 213/830-4522